



جامعة صنعاء
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دائرة العلوم السريرية الطبية
دفعة بصمه طبيب 31
طب بشري

OPHTHALMOLOGY



Sclera

Lecture No. **2**

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اللجنة العلمية لدفعة بصمة طبيب 31

مندوب الدفعة

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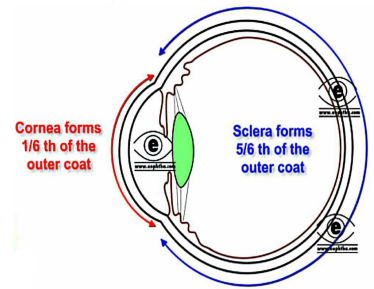


- Sclera Formed $5/6$ of Tenon's Capsule.
- Cornea Formed of $1/6$ of Part of Tenon's Capsule.

What is meaning "Sclera" ??

it's derived From Greek word Scleros = Hard.

- Rigid أو تسمى بالعربي الجلبة لأن شكلها



The Sclera is the opaque, Fibrous, Protective outer layer of Eye.

Components of Sclera :-

Sclera Containing collagen and elastic Fibers. as shape Band

Band → Contain about 10-14 mm of Sclera thickness and weight about 100-140 Mic. = that's collagen Fibers.

Collagen Fiber of Sclera Same collagen Fibers which Found in Cornea but collagen in Sclera → "irregular arrangement",

Position Radial on Limbus & Collagen Fibers in Cornea → transparent due to ① avascular ② denervated of fibers. and "Regular arrangement" of collagen.

Sclera act continuous with cornea and conjugation in Limbus anteriorly & in Posteriorly Sclera act continuous with dural sheaths of optic Nerve.

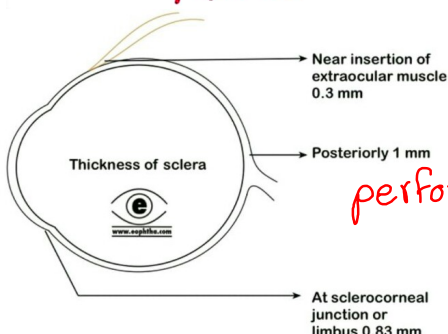
- Sclera originate From Mesoderm.

Thickness of Sclera → Near the optic Nerve at posteriorly = 1 mm. the most thick area.

MCQs

→ in the equator about = 0.8 mm.

→ thin area in Behind the insertion of Recti muscles about = 0.3 mm.



perforation or Trauma maybe occurs in weak area.

[2]

Sclera

The Sclera perforated some of structures may be exit From the Eye or Enter to Eye.

three apertures in sclera that's act as Perforation :-

1] Posterior apertures :- Around the optic Nerve.

→ Long } → Ciliary Vessels and Nerves.
→ Short }

2] Middle apertures :- Located 4 mm behind equator
→ 4 vortex veins.

3] Anterior apertures :- at the insertion of Rect muscle.
→ transmit anterior ciliary vessels & nerves.

Blood & Nerve Supply of Sclera :-

= From the vessels that pierce the Sclera :-

- Arteries: ant. ciliary & post. ciliary
Long -
Short -

- Veins: ant. ciliary vein

- Nerves: short & long ciliary nerves.

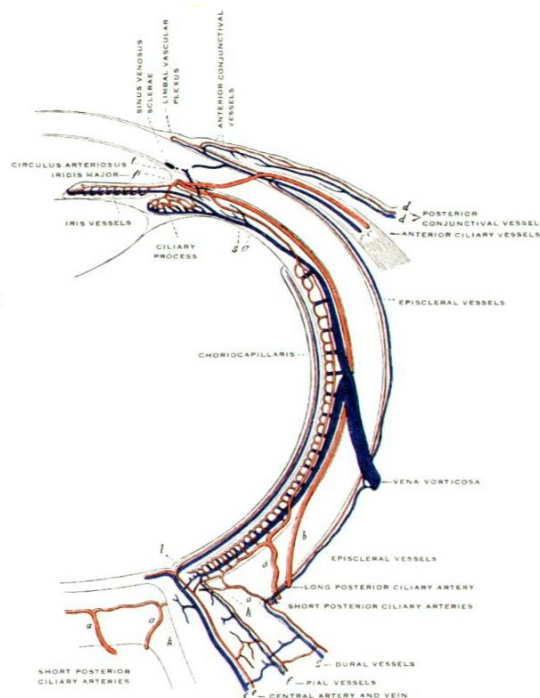
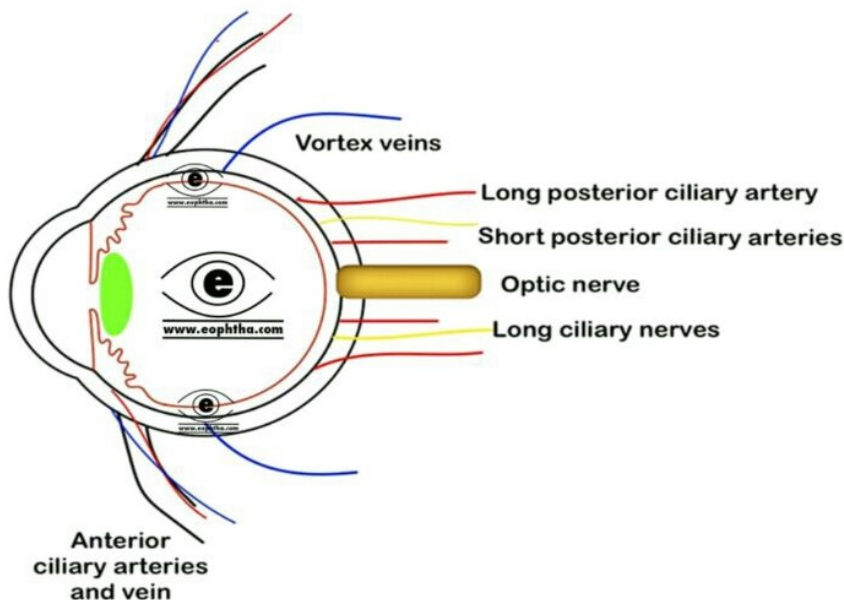


FIG. 86. - THE BLOOD-SUPPLY OF THE EYE. (From Leber.)

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MCQs

Sclera

Structures of Sclera ??

Sclera consist of three layers :-

- 1- Episclera 2- Sclera Proper (stroma) 3- Lamina Fusca

Sclera surface From anterior covered by Conjunctiva (mucus memb)
and From posterior covered by orbital Fat or septum.

wherefore layering of layer as Conjunctiva → Tenon's capsule

→ Episclera → innermost layer (Lamina Fusca)

± Shape of sclera :- white , sometimes in child sclera → thin Blue
but in old persons the sclera Not white, due to deposition of Fat.

* Episclera :- thin vascular elastic membrane and C-T
" Rich Blood Supply . "

* Sclera :- relatively vascular & poorly innervation.

* Lamina Fusca (innermost layer) :- Pigmented layer of melanocytes.

Note : space b/w Lamina Fusca and Choroid ciliary body
called Suprachoroida space or
Supra ciliary space.

Functions of Sclera ??

1- shape of Eye " due to Hard "

2- protection of structures < Choroid-
Retina.

3- Provides attachment for Extraocular muscles.

Insertion of Recti muscles ??

Medial = at 5.5 mm From Limbus. Lateral = 7.0 mm From Limbus

Superior = 7.7 mm .

inferior = 6.5 mm .

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Sclera

Diseases of Sclera ??

the most common diseases of the Sclera = inflammation
inflammation classification according anatomical into

Episcleritis Scleritis

also other diseases = congenital, metabolic, degenerative, Neoplastic

Episcleritis

What's Episcleritis = inflammation of Episclera affecting the deep-sub-conjunctiva C-T including the superficial Scleral Lamella.

What's characteristic of Episcleritis??

1- Self Limiting.

2- Recurrent disease.

3- Typical affects of young adult

4- male > female.

Causes of Episcleritis ??

→ Most Cases are idiopathic.

→ 1/3 of Cases ass e systemic diseases as ?

→ RA, Sjogren's Syndrome, ankylosing Spondylitis
→ syphilis, TB, Herpes Zoster, Gout.

Clinical Types of Episcleritis ??

Simple Episcleritis.

Nodular Episcleritis.

Localized.

Diffuse.

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Sclera

Simple Episcleritis = Most common, according to area maybe Localized or Diffuse

- Localized = may be one suture site or one quadrant.
- Diffuse = maybe entire of anterior surface of Eye.

Clinical picture of Simple Episcleritis ⇒ ① Redness ② Discomfort Pain

Nodular Episcleritis :- more Painful and Last Longer
- often ass. w/ sys. diseases as RA, Lupus.

↳ characterized by Nodule, Rise on surface of Sclera
moveable Nodule.

⊗ Symptoms of Episcleritis ??

- Redness of Eye → قرطاش المرضي في العين
- Mild or moderate discomfort → in case of Simple Episcleritis
- Painful in case → Nodular Episcleritis.
- Tenderness on pressure in case Nodular Episcleritis
- Lacrimation.

⊗ Treatment :- Episcleritis :-

→ if was Simple Episcleritis → often Not Requires of th
but if was irritation or Pain may Requires
artificial Drops or Lubricant, and topical corticosteroids

→ if was Nodular Episcleritis Longstanding we give
Local Corticosteroid Drops for ↓ of inflammation and congestion

→ if more Painful give « NSAIDs »

Notes in Episcleritis not occurs infected corneal or
Uveal tract, thence not occurs Keratitis.
Uveitis.

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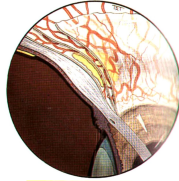
ScleraScleritis

Definition :- Severe, destructive, vision threatening inf inflammatory, involving the - Deep Episclera and Sclera.

Characterized of scleritis :-

- 1- affecting Both Eyes.
- 2- Female > male.
- 3- Less Common of Episcleritis ← Episcleritis أكثر شيوعاً #
- 4- It's occurs in old age group > 50 years.

* 20 شجرة شمسية +
→ في داءات sclera



- 1- Swelling of sclera
- 2- edema in Episclera
- 3- Invasive of conjunctiva.

Causes of Scleritis :-

- 1- May occurs isolated 43%.
- 2- ass. with Systemic diseases about 56%.

AS → Autoimmune diseases → RA, IGA Nephropathy, SLE, U.C, P-Nodosa

Granulomatous diseases

- T.B, Leprosy, Syphilis

→ Vogt-Koyanagi-Harada-Syndrome

It's characterized by Bilateral diffuse Uveitis with pain, Blue Whitish and Blurring of vision, when affect on Uveal tract Lead to "Exudative Retinal detachment"

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Sclera

Metabolic disorders as - Gout →

هذا اللي عنده Scleritis

← Uric acid عنده ← مرتفع .

infections $\approx 7\%$ as - Toxoplasmosis, Staph & strept. infections
 - H. Zoster and H. Simplex
 - Pseudomonas infection.

others $\approx 2\%$:-

Physical	Chemical	Mechanical
↓	↓	↓
- Irradiation	any chemical irritant	Penetrating Trauma.
- after operation		
- Thermal Burns		

⊕ Symptoms of Scleritis :-

1- severe penetrating Pain, Radiated to Forehead, Brow, Sinus.

2- watering, Redness, Photo Phobia

3- ↓ V/A ~~due to~~ ① destruction affect on
 Cornea.
 Uveal tract.

② ↓ OP in Late stage of Scleritis.

Classification of Scleritis (according to anatomical position)

Anterior Scleritis 98%.

Posterior Scleritis.
 2%.

Scleritis Diffuse.

Nodular Scleritis.

Necrotizing Scleritis. 13%.

Non-Necrotizing 85%.

Diffuse Scleritis :-

↳ Most Common Type of Scleritis.

↳ accounts for about 50% of Scleritis cases.

↳ More wide spread involving

Segment of globe.

Entire anterior sclera.

Nodular Anterior Scleritis :-

↳ characterized by :- ① Presence one or more Nodule in sclera.

② less circumscribed than Episcleritis.

③ First = Dark Red then → bluish Red
Late = purple and semitransparent.

Necrotizing Anterior Scleritis :-

↳ inflammation

↳ Most severe lead to destroy
scleral tissue 50% from
Cases of Necrotizing Scleritis

ass → 50% cause Systemic dis.

Without inflammation

((Per Forans scleromal))

↳ Less pain due to loss
of sensation.

↳ ass → RA disease

posterior Scleritis :- Rare Form, Not Related to Systemic dis.

↳ Clinical signs :- ① Vitritis, Proptosis.

② Disc Swelling

③ exudative Retinal detachment.

④ Limitation of Eye movement due to swelling leads
tightening muscle of Eye.

Dx of Scleritis :-(A) History :-

- main complaint
- Hx of past & systemic diseases.

(B) Physical Examination :-

- scleral Exa.
- Genral Exa. by slit lamp

(C) Lab. studies

- Based on past history.

(D) Imaging studies :-

- chest X-ray, sinus film
- U/S → for posterior scleritis
- MRI = thick sclera = post-scleritis

complication of Scleritis :-

- ① Diffuse stromal Keratitis
- ② Sclerosing Stromal Keratitis
- ③ Deep Keratitis
- ④ Glaucoma → ^{due to} uveal tract inflammation
- ⑤ Cataract
- ⑥ optic Neuritis
- ⑦ Uveitis.
- ⑧ Staphylocoma.

Treatment of Scleritis

- ① Medical ttt.
- ② Surgical ttt.

(A) Medical ttt① Diffuse or Nodular scleritis

↳ by NSAIDs, if not effected,

add oral corticosteroid

⊕ NSAIDs but if this combination not effected, you give immunosuppressive drugs.

② Nectrotizing scleritis ⇒ ttt by immunosuppressive drugs, not used NSAIDs & Neurotizing.③ Infections & Scleritis ⇒ ttt of Cause of infection.(B) Surgical ttt :-

- ① in some case of perforation need for scleral graft.
- ② if corneal affect used Keratoplasty.

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Sclera

D.D 113 - Blue Sclera = bluish discoloration

⇒ thin and transparent sclera allow underlying uvea to be seen. *may be*

Normal

infant

Children

↳ thin sclera

لكن مع تقدم العمر في Fat deposition
↳ thick Sclera.

abNormal e.g

① Kerato conus → may occurs in sclera → thin Sclera

② Keratoglobus

③ Buphthalmos :- in infant Result of ↑ IOP lead to stretched of Sclera lead to thin sclera.

④ C-T and collagen disease due to destruction of collagen Fibers
↳ thin sclera

as :- ① osteogenic imperfecta.
② Marfan's syndrome.
③ Ehler danals //

⑤ Prolonged Use corticosteroid
↳ act thinning of sclera



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Sclera

⊕ Staphyloma :-

^{Def} Definition :- Bulging of Uvea into Sclera.

Pathogenesis :- ① ↑ IOP $\xrightarrow{\text{Lead to}}$ Staphyloma
↳ as congenital glaucoma case

② inflammation or Trauma or after Surgery operation $\rightarrow$ Convert Sclera from thick $\xrightarrow{\text{into}}$ thin due to destroy collagen fibers.

Note Staphyloma not absolute disease but disease Result other diseases as inflammation or trauma or surgery.

Clinical types of Staphyloma :-

① Anterior staphyloma

② Equatorial staphyloma.

③ Posterior staphyloma $\rightarrow$ Most common seen at optic Nerve.

$\Rightarrow$ Anterior staphyloma

Gliary staphyloma

↳ in cornea or Anterior of Sclera

intercalary Staphyloma

↳ b/w Limbus and ciliary body.

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* أسئلة دفع سابقة الموضوع

Sclera

MCQs 29

1] The thinnest part of sclera at :-

- C - equator.
A - limbus.
B - behind insertion of extra ocular
D - posterior pole

2] Scleritis characterized by all following except :-

- A - Diffuse
B - mild pain
C - ↓ V/A
D - Female > male

MCQs 30

1] Sclera is developed from :-

- A - Mesoderm

* All are complication of scleritis except :-

- 1 - Uveitis.
2 - Sclero keratitis.
3 - Conjunctivitis.
4 - Optic Neuro pthy.
5 - Staphylocoma.

* D.D of Blue sclera ??

* Define of Staphylocoma ??



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Group-C